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BULLETIN
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Studies on the Rocky Mountain flora—XXVII

PER AXEL RYDBERG

SALICACEAE

POPULUS HASTATA Dode, Extr. Mon. Gen. Populus (Mém. Soc.
Hist. Nat. Autun 18:) 64. 1905

Some years ago we were forced to admit one of Dode's species, *P. Sargentii*. I say forced, because Dode's paper is presented in such an unscientific way that any one might feel inclined to ignore it altogether. His differentiations are based wholly on the leaf forms, and in very few genera do the leaves show so great variation as in *Populus*. In working over Mr. Butler's collection of Montana plants I found numerous specimens of a poplar which has usually been regarded as *P. balsamifera* L., sometimes as *P. trichocarpa* T. & G. A study of the fruit shows that this poplar has the sessile and 3-carpellary fruit and the large involucre cup of *P. trichocarpa*, but the capsule is proportionally longer than in that species and perfectly glabrous. The eastern *P. balsamifera* has evident pedicels and almost always 2-carpellary ovary and much smaller involucre cup. The leaves are usually broader than in *P. balsamifera* and often subcordate at the base. They resemble much those of *P. candicans* Ait. in outline but are perfectly glabrous. *P. candicans* has also pediceled and 2-carpellary capsules. It is apparent that this species represented by Butler's material is *P. hastata* of Dode, for he associated it with *P. trichocarpa* and pointed out just the characters by which it differs from that species. The name *hastata* was given in reference to the

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form of the young leaves, which he described as being hastate. His idea of the term hastate must have been rather strange, for he figured the different leaf forms, and the form of leaf illustrated as representing the young shoots is elongate-ovate with slightly cordate base.

It is represented in the herbarium of the New York Botanical Garden by the following specimens:

ALBERTA: Bow River, May 26, 1899, *McCalla 2236*.

MONTANA: Flathead Lake, July 23, 1900, *J. W. Blankinship*; Columbia Falls, September 14, 1892, *R. S. Williams* (both determined as *P. balsamifera candicans*); various localities in Montana, *Butler 124, 125, 126, 127, 128, 137*. To this may also belong the following, which are in leaf only: *Butler 112, 113, 114, 135, 147*.

IDAHO: Salubria, July 10, 1899, *M. E. Jones 6541* (labeled *P. trichocarpa*).

POPULUS BESSEYANA Dode, loc. cit. 38

Another poplar collected by Butler seems to be impossible to identify with any of the accepted species. Butler's material is all in leaf only, but there is in our collection one specimen collected by Miss Isabel Mulford, in Idaho, which evidently belongs here, and this specimen is in fruit. It is evidently related to *P. deltoides* Marsh., but the leaf shape is different and the pedicels are very short, shorter than the capsule. The young stems are perfectly terete, not at all angled; the bases of the leaves of the mature branches are rounded or subcuneate at the base and more or less serrate along the base; the basal glands are small and the petioles flattened. In *P. Sargentii* Dode the leaves are flabellate-cordate, with an open concave sinus at the base, which is toothless. The leaves resemble much *P. acuminata* Rydberg but are broader and less cuneate at the base, and in the latter species the petioles are terete. I adopt Dode's name, not because I can definitely identify it by his diagnosis but because his illustrations of the leaves resemble those of this species.

To this belong the following specimens:

IDAHO: Fish Haven, August 8, 1898, *Isabel Mulford 263*.

MONTANA: Delta of Flathead River, Big Forks, Montana, August 14, 1901, *Umbach 192*; and from several localities, *Butler 109, 111, 115, 116, 117, 120, 136, 139, 140, 144, 145, 149, 153*.

POPULUS FREMONTII Torr.

The known range of this species was extended last summer, when it was collected by Professor A. O. Garrett and the writer in and around the town of Moab, southeastern Utah; and specimens evidently also belonging to it were seen in the Cottonwood and White canyons about 100 miles farther southwest.

Willow hybrids are not uncommon in Europe and rather common in cultivation; but we find very rarely any references to any spontaneous hybrids of American species mentioned. It will therefore not be out of place to record the following specimens probably representing hybrids, although no definite proof can be given of their origin.

Salix cordata × *S. monticola*

The shrubs referred here have capsules shorter than in *S. cordata* Muhl. but longer than in *S. monticola* Bebb; the habit and the bark are those of the latter; but the narrow leaves (although less serrate) and the bractlets are those of *S. cordata angustata* (Pursh) Anders., the form of *S. cordata* common in the Rockies. The capsules of the specimens seen usually remained undeveloped. The staminate catkins resemble most those of *S. monticola*. *S. monticola* was growing mixed in with the supposed hybrid. *S. cordata angustata* is also growing in the Big Cotton Canyon, although no specimens of it were noticed in the immediate vicinity where the plants were collected.

UTAH: Big Cottonwood Canyon, below Silver Lake, July 11, 1905, *Rydberg 6877, 6878, and 6883*; July 4, 1905, *Rydberg & Carlton 6615*.

Salix glaucops × *S. monticola*

The specimens resemble *S. glaucops* Anders. in the capsules and bractlets, but the former are less densely hairy; the leaves are more like those of *S. monticola*, being finely serrate, glabrate in age and glaucous beneath; the young branches are somewhat villous. Both *S. monticola* and *S. glaucops* are growing in the Big Cottonwood Canyon.

UTAH: Big Cottonwood Canyon, Salt Lake City County, August 23, 1905, *A. O. Garrett 1671*.

Salix Sandbergii sp. nov.

Bark of the branches reddish chestnut brown, finely puberulent when young; leaves oval or elliptic, 2-4 cm. long, densely white-silky on both sides, grayish above, silvery beneath, entire or nearly so; pistillate aments sessile, naked, about 4 cm. long; bractlets purple, obovate-spatulate, 3 mm. long, white-pilose; capsule glabrous, 4-5 mm. long; stipe about 1.5 mm. long; style about 0.5 mm. long; lobes of stigma short.

The type was distributed as *Salix lasiolepis* Benth., to which it is not at all closely related. The leaves resemble somewhat those of *S. sitchensis* Sanson and *S. bella* Piper, but the capsule is glabrous and the plant belongs to the *S. cordata* group. On account of the white leaves it would be placed next to *S. Hookeriana* Barrett, but the leaves are silky, not villous, and entire, and the aments and capsules are much smaller. It grows on banks of streams.

IDAHO: Valley of Hatwai Creek, April 28, 1892, *Sandberg, MacDougal & Heller 71* (type, in herb. N. Y. Bot. Garden).

The following species of willows are here recorded for the Rocky Mountain region: *Salix erythrocoma* Barrett (*S. arguta erythrocoma* Anderson), *S. lucida* Muhl., *S. Hookeriana* Barrett, *S. conjuncta* Bebb, *S. MacCalliana* Rowley, *S. alexensis* (Anders.) Coville, *S. Barrettiana* Hook., *S. Seemanii* Rydb., *S. Drummondiana* Barrett, *S. arbusculoides* Anders., *S. desertorum* Richards., *S. saskatchewanana* Seem., and *S. Fernaldii* Blankinship, from the Canadian Rockies south of the 55° parallel; and *S. conjuncta* Bebb and *S. Fernaldii* Blankinship also from Montana.

ULMACEAE

Celtis rugosa sp. nov.

A tree, 5-10 m. high, with rounded crown; bark gray, corky; twigs brownish, pubescent when young; petioles 6-10 mm. long; leaf blades broadly ovate, oblique, 4-7 cm. long, somewhat cordate at the base, short-acuminate, sharply serrate except at the base and at the apex, coriaceous, dark green, very shiny and slightly scabrous above, brownish or yellowish green, dull, puberulent beneath, strongly reticulate and rugose; pedicels 15-25 mm. long; fruit globose, about 8 mm. in diameter, brownish; style short but evident.

This species is related to *C. reticulata* Torr. but differs in its

longer pedicels (in *C. reticulata* 1 cm. long or less) and in its serrate, short-acuminate leaves, which are less pubescent, more shiny, and much less rough above. It grows in gulches and mountain valleys of Colorado.

COLORADO: Golden, Aug. 29, 1895, *P. A. Rydberg* (herb. N. Y. Bot. Garden); Aug. 30, 1895, *C. L. Shear* 3263; gulch west of Pen-nock's mountain ranch, May 26, 1897, *C. S. Crandall* 2254.

Celtis occidentalis L. is included in the Rocky Mountain flora by Coulter & Nelson,* but erroneously so, the writer thinks. *Celtis Douglasii* Planchon, *C. rugosa*, and perhaps also *C. reticulata* Torr. have been mistaken for it.

URTICACEAE

Urtica strigosissima sp. nov.

Perennial, dioecious; stem 1 m. high or more, glabrous below, strongly retrorsely strigulose above, but almost without bristles; stipules narrowly linear-lanceolate, acuminate; petioles 2-3 cm. long; leaf blades lanceolate, 3-5-ribbed, sharply serrate, rounded or acute at the base, long-acuminate at the apex, 5-10 cm. long, 1.5-5 cm. wide, finely strigulose beneath; flower clusters slender, the upper almost equalling the leaves; sepals ovate, about equaling the achenes.

This species resembles *U. gracilis* Ait. in habit and leaf form, but is more strigose and rarely at all bristly. In pubescence it resembles *U. Breweri* S. Wats. but has narrower leaves and narrowly linear-lanceolate, acuminate, instead of oblong and obtuse, stipules. It grows on river banks at an altitude of 1,000-2,500 m.

IDAHO: Forest, Nez Perces County, July 29, 1896, *A. A. & E. Gertrude Heller* 3475 (herb. Columbia University).

Urtica viridis sp. nov.

Perennial with a horizontal rootstock, dioecious; stem 1-1.5 m. high, slender, glabrous or sparingly bristly, round-angled; stipules linear-lanceolate, acuminate, 5-8 mm. long; petioles short, one fifth to one third as long as the leaf blades; these from narrowly lanceolate to ovate, coarsely toothed, 4-10 cm. long, thin, light green, almost glabrous; panicles many-flowered, often equalling the upper leaves: sepals oval or ovate, usually half longer than the achenes.

* New Man. Bot. Cent. Rocky Mts. 143.

This species is closely related to *U. cardiophylla* Rydb. but differs in its narrower leaf blades, shorter petioles, longer and denser inflorescence, and longer sepals. In habit it closely resembles *U. gracilis* but differs in its practically glabrous stem and thinner and more glabrous leaves.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey* 3935 (type, in herb. N. Y. Bot. Garden); Jack Creek Canyon, July 15, 1897, 3936; Jocko Creek, June 10, 1901, *D. T. MacDougal* 275; Melrose, July 6, 1895, *P. A. Rydberg* 2612; Lima, Aug. 6, 1895, *Rydberg* 2613.

WYOMING: Halleck Canyon, July 4, 1900, *Aven Nelson* 7444.

IDAHO: Priest Lake, July 28, 1900, *D. T. MacDougal* 235; Cooper's Warm Springs, July 1892, *Isabel Mulford*.

ALBERTA: Rocky Mountains, 1858, *E. Bourgeau*.

***Parietaria occidentalis* sp. nov.**

Annual; stem slender, erect, simple or branched at the base, long-villous, 1-4 dm. high; leaf blades thin, light green, lanceolate, acute at the base, obtuse at the apex, 1-4 cm. long, 5-18 mm. wide, sparingly pubescent; bracts of the involucre linear, obtuse; sepals oblong or lance-oblong, obtuse or acutish.

This species is related to *P. pennsylvanica* Muhl. but differs in the long hairs of its stem, light green color, and the more obtusish sepals. It grows in moist shaded places.

IDAHO: Clearwater River, Nez Perces County, May 14, 1892, *Sandberg, MacDougal & Heller* 176 (type, in herb. N. Y. Bot. Garden).

WASHINGTON: Wawawai, May 1897, *Elmer* 755; Alamota, June 1893, *Piper* 1507.

NEVADA: East Humboldt Mountains, August 1868, *S. Watson* 1084.

POLYGONACEAE

***Eriogonum biumbellatum* sp. nov.**

Suffrutescent perennial, branched at the base; leaves basal, clustered at the ends of the short branches, 2-5 cm. long, short-petioled; blades oblanceolate, finely tomentose on both sides when young, soon glabrate and green on both sides; scapes 2-3 dm. high, sparingly tomentose; involucre in compound umbels; bracts verticillate, similar to the leaves but smaller; involucre with a

turbinate tube, which is about 2 mm. long, slightly tomentose; its lobes oblong, 1.5–2 mm. long, obtuse; perianth yellow, glabrous, 3–4 mm. long, with a stipelike base; divisions elliptic, obtuse, the outer slightly longer than the inner; filaments ciliate; ovary more or less hairy above, 3-angled.

This species is related to *E. umbellatum* Torr., *E. neglectum* Greene (*E. umbelliferum* Small), and *E. croceum* Small. It has the compound inflorescence of the last one, but the leaves are green and glabrate in age and much narrower than in the other species mentioned.

UTAH: Fish Lake around Twin Creeks, August 8, 1905, *Rydb. & Carlton* 7376, 7409, and 7483; Fish Creek Canyon, August 2, 1909, *A. O. Garrett* 2568.

***Eriogonum idahoense* sp. nov.**

Shrub 4–6 dm. high with gray bark; branches more or less tomentose, erect; leaves 2–3 cm. long, short-petioled; blades oblanceolate, white-tomentose beneath, loosely floccose and soon glabrate above; floral branches about 1 dm. high; inflorescence a compound trichotomous flat-topped cyme; involucre in the axils peduncled; peduncles of the lower forks 1 cm. long; branches of the cymes short, not over 5 cm. long; involucre turbinate, about 3 mm. long, floccose; lobes about 1 mm. long, lanceolate-oblong, obtuse; perianth yellow, glabrous, about 2 mm. long, without stipe-like base; fruit unknown.

The type was labeled *Eriogonum microthecum* Nutt., which it resembles in habit, but the flowers are yellow instead of pink or white, and the lobes of the involucre are longer and not scarious-margined. It is more closely related to *E. orendense* A. Nels. and *E. campanulatum* Nutt. From the first it is distinguished by the leaves, which are glabrate above, the tall stem, and the more open inflorescence; from *E. campanulatum* by the tall shrubby habit and the tomentose involucre.

IDAHO: Wieser, July 7, 1899, *M. E. Jones* 6511 (type, in herb. N. Y. Bot. Garden).

***Eriogonum spathuliforme* sp. nov.**

Perennial, shrubby at the base, leaves all near the base; petioles 1–2 cm. long; blades elliptic to spatulate, 1–3.5 cm. long, white-tomentose on both sides, densely so beneath; stem scapiform,

2-3 dm. high, trichotomously branched, with ascending branches; bracts triangular, 5 mm. long or less; involucre in the lower forks short-peduncled, the rest sessile, glabrous, turbinate, 3 mm. long; lobes rounded, scarious-margined; perianth white, glabrous, 2-2.5 mm. long, campanulate; divisions equal, obovate; filaments slightly hairy below; ovary glabrous.

In habit and leaf form this species resembles *E. spathulatum* A. Gray, but the involucre is glabrous instead of tomentose, and the lower ones are peduncled; the stem is also perfectly glabrous. It differs from *E. tristichum* Small and *E. salicinum* Greene in its broader leaves and the scarious-margined lobes of the involucre. Jones' specimens are smaller and more cespitose than the type.

UTAH: Sandy washes near Belknap, June 12, 1900, *Stokes* (type, in herb. N. Y. Bot. Garden); Marysvale, August 30, 1894, *M. E. Jones* 5969 (?).

***Eriogonum depressum* (Blankinship) Rydb. comb. nov.**

Eriogonum ovalifolium depressum Blankinship, Mont. Agr. Coll. Sci. Stud. Bot. 1: 49. 1905.

Eriogonum rubidum frigidum Gand. Bull. Soc. Bot. Belg. 42: 194. 1906.

Dr. J. K. Small has for some years regarded this as a distinct species, and it is found in the herbarium of the New York Botanical Garden under a manuscript name of his, which, however, was never published.

Eriogonum ramosissimum Eastwood is related to *E. Wrightii* Torr. and does not belong to the *corymbosum* group, to which it was referred.

Eriogonum crassifolium Benth. is the same as the original *E. flavum* Nutt. What Coulter & Nelson and others have regarded as *E. flavum* should be known as *E. chloranthum* Greene. *E. aureum* Nutt. is the same, but the name was first published as a hyponym, and when finally it was properly published there was already an *E. aureum* Jones.

Torrey and Gray, in their revision of *Eriogonum*, described *E. strictum* Benth. as having subequal sepals, and they have been followed by S. Watson and others. Bentham, in his original description of the species, did not mention whether the perianth

lobes are equal or not, but in his subsequent treatise of the genus in De Candolle's *Prodromus* he expressly stated that they are unequal. In the only two specimens found in the herbarium of the New York Botanical Garden, in my opinion belonging to *E. strictum*, the outer perianth lobes are very broadly oval while the inner are oblong. The species should therefore be associated with *E. dichotomum* Dougl. and not with *E. racemosum* Nutt. and *E. Wrightii* Torr., differing from the first principally in the glabrous involucre. Both *E. strictum* and *E. dichotomum* have been collected in Idaho.

The genus *Eriogonum* is represented by over one hundred species in the Rocky Mountain region. The following ones are not recorded either by Coulter & Nelson nor in my *Flora of Colorado* or in my *Flora of Montana*, but they should be included in the flora: *E. androsaceum* Benth. in Alberta, Montana, and British Columbia; *E. thymoides* Benth., *E. compositum* Dougl., *E. proliferum* Benth., *E. elatum* Dougl., *E. strictum* Benth., *E. spargulinum* A. Gray, and *E. vimineum* Dougl., in Idaho; *E. dichotomum* in Idaho and Montana; *E. micranthum* Nutt., *E. nidularium* Coville, and *E. Baileyi* S. Wats., in Idaho and Utah; *E. Porteri* Small, *E. pulvinatum* Small, *E. longilobum* M. E. Jones, *E. ochrocephalum* S. Wats., *E. villiflorum* A. Gray., *E. Shockleyi* S. Wats., *E. polifolium* Benth., *E. Thompsonae* S. Wats., *E. aureum* M. E. Jones, *E. spathulatum* A. Gray, *E. leptophyllum* Torr., *E. bicolor* M. E. Jones, *E. clavellatum* Small, *E. sulcatum* S. Wats., *E. Mearnsii* Parry, *E. ramosissimum* Eastw., *E. densum* Greene, *E. turbinatum* Small, *E. insigne* S. Wats., *E. deflexum* Torr., *E. nutans* T. & G., *E. Wetherillii* Eastw., *E. Thomasii* Torr., *E. subreniforme* S. Wats., *E. Parryi* A. Gray, *E. Ordii* S. Wats., *E. trichopodium* Torr., *E. angulosum* Benth., and *E. puberulum* S. Wats., in Utah; *E. Hookeri* in Utah and Wyoming; *E. tenellum* Torr. in Colorado; and *E. depauperatum* Small in the Black Hills of South Dakota.

***Chorizanthe spathulata* Small sp. nov.**

A more or less branched annual; stem 5–20 cm. high, erect, strigose-canescens; branches erect, strict; lower leaves petioled, 1.5–3 cm. long; blades broadly spatulate, somewhat fleshy, hirsute-strigose on both sides, rounded and sometimes mucronate at the

apex; stem leaves few, spatulate or oblanceolate, much smaller; bracts linear or linear-oblanceolate, arcuate-recurved, spinulose-tipped; involucre cylindroprismatic, 5 mm. long, angled and grooved, strigose; lobes 6, subulate, recurved, spinulose-tipped, the alternating ones somewhat narrower; perianth about 2 mm. long, lobes ovate; stamens mostly 3 (?); filaments adnate to the lower part of the perianth.

This species is related to *C. brevicornu* Torr., and Torrey and Gray included doubtfully Watson's specimens in that species.* It differs in its broader lower leaves and its strict erect branches.

IDAHO: Big Butte Station, June 23, 1863, *Edward Palmer 230* (type, in herb. Columbia University).

NEVADA: 1875, *J. G. Lemmon*; Big Bend of the Truckee, May 1868, *S. Watson 1044*.

CHENOPODIACEAE

Chenopodium pratericola sp. nov.

Annual; stem 3–6 dm. high, striate and angled, nearly glabrous; leaves petioled; blades oblong, lanceolate, or elliptic, 2–6 cm. long, 4–18 mm. wide, entire or with a short tooth on each side, usually callous-mucronate, green and nearly glabrous above, more or less mealy beneath, usually distinctly 3-nerved at the base; flowers in small clusters forming rather dense spikes or panicles; sepals scarious-margined, green on the back, slightly carinate; seeds easily separating from the pericarp, black, shining, about 1.5 mm. in diameter.

This has been included in *C. leptophyllum* (Moq.) Nutt. by most botanists although sometimes confused with *C. oblongifolium* (S. Wats.) Rydb. on account of its broad leaf blades. It differs from the former in its broader leaves, which are practically glabrous on the upper side, distinctly 3-nerved at the base, and at least the larger ones often toothed on the margins. From the latter it differs in its thin, more glabrate leaves and less dense inflorescence.

KANSAS: Riley County, August 2, 1895, *J. B. Norton 436* (type, in herb. N. Y. Bot. Garden).

NEBRASKA: Middle Loupe River, near Thedford, June 21, 1893, *Rydberg 1386*; Forks of Dismal River, July 11, 1893, *Rydberg 1835*; Kearney County, June 13, 1891, *Rydberg 318*.

MISSOURI: Courtney, June 25, 1896, *Bush 367*.

* See Proc. Am. Acad. 8: 196. 1870.

IDAHO: Lewiston, June 13, 1896, *Heller* 3244.

NEW MEXICO: Mesilla, June 3, 1897, *Wooton* 84.

WYOMING: Platte River, July 14, 1894, *Aven Nelson* 483; Snake River, 1900, *C. C. Curtis*.

ARIZONA: 1876, *Palmer* 448.

Chenopodium succosum A. Nels. is in my opinion a synonym of *C. rubrum* L., being the common American form thereof, and *C. desiccatum* is probably only a small form of *C. oblongifolium* (S. Wats.) Rydb.

Chenopodium lanceolatum Muhl. and *C. paganum* Reich., the former an eastern plant and the latter a European weed, both often erroneously known as *C. viride* L., have been collected in Colorado. The original *C. viride* L. is the same as *C. opulifolium* Schrad. of Europe, not known as occurring in this country. *C. viride* and *C. opulifolium* were based on the same illustration.

Monolepis spathulata A. Gray has been collected in Idaho.

Atriplex odontophora Rydb. is not a synonym of *A. canescens* (Pursh) James but of *A. aptera* A. Nels. instead.

***Atriplex buxifolia* sp. nov.**

A suffruticose perennial; stem branched near the base, with simple branches, 3–4 dm. high; leaves sessile, elliptic or oval, thick, 1–2 cm. long; pistillate flowers in axillary clusters; fruiting bracts ovate, acute, 4–5 mm. long, toothed on the margins, with thick, often flattened processes on the faces.

This is related to *A. Nuttallii* but distinguished by its short oval or elliptic, often fascicled leaves, its simple wandlike branches and small fruit. It grows on dry plains at an altitude of about 1,200 m.

WYOMING: Dayton, Sheridan County, September 1899, *F. Tweedy* 2656 (type, in herb. N. Y. Bot. Garden).

***Atriplex tetraptera* (Benth.) Rydb. comb. nov.**

Obione tetraptera Benth. Bot. Sulph. 48. 1844.

This has usually been regarded as the same as *A. canescens* (Pursh) James but differs in its narrow, linear leaves, only 2–5 mm. wide, in its more strongly reticulate fruit wings, which have a broad sinus at the apex, and in that the free portion of the

bracts is less than half as long as the width of the wing. It differs from *A. occidentalis* Torr. in its narrower and sharply toothed wing.

Atriplex Garrettii sp. nov.

A low shrub, with straw-colored branches; leaves short-petioled, oval, 2–3 cm. long, grayish, scurfy on both sides, acute at the base, abruptly acuminate at the apex; flowers in axillary and terminal clusters; bracts about 8 mm. long and about as broad, 4-winged, coarsely toothed and occasionally with a few additional processes, with a broad open sinus at the apex; free portion 1–2 mm. long.

The fruit would associate this species with *A. canescens*, *A. occidentalis*, and *A. tetraptera*, but the leaves are quite different in shape. The plant looks in general habit somewhat like *A. confertifolia*, but the fruiting bracts are altogether different. It grows in arid valleys at an altitude of about 1,200 m.

UTAH: Vicinity of Moab, July 1, 1911, *Rydb. & Garrett 8465* (type, in herb. N. Y. Bot. Garden).

Endolepis phyllostegia (Torr.) Rydb. comb. nov.

Obione phyllostegia Torr. in Wats. Bot. King Exp. 291. 1871.

Atriplex phyllostegia S. Wats. Proc. Am. Acad. 9: 108. 1874.

This species should be transferred from *Atriplex* to *Endolepis*, as sepals are present in the pistillate flowers.

Eurotia subspinosa sp. nov.

A dioecious shrub, 6–10 dm. high; branches ascending or spreading, becoming more or less spinescent, finely grayish stellate-tomentose but without longer hairs; leaves linear or oblong, obtuse, entire, 1–3 cm. long, or the secondary ones only 5 mm. long and comparatively broader, with revolute margins; flower clusters axillary, those of the staminate plant crowded and forming simple leafy spikes; fruiting bracts lanceolate, about 6 mm. long; horns usually about 2 mm. long.

This species is more decidedly shrubby than *E. lanata* (Pursh) Moq. and evidently always dioecious, has ascending or spreading branches, which become spinescent, lacks the long hairs intermixed with the stellate pubescence characteristic of *E. lanata*, and has usually longer horns. In *E. lanata* the branches are erect, and the plant is shrubby only at the base. The predominantly

staminate plant has a few pistillate flowers borne on the lower part of the branches. The predominantly pistillate plant has often a few staminate clusters above but is sometimes wholly pistillate. *E. subspinoso* grows on rocky hills in the desert regions.

UTAH: Rocky summits, St. George, May 15, 1903, *Goodding* 810 (type, in herb. N. Y. Bot. Garden); 1874, *C. C. Parry* 725; 1875, *E. Palmer*; April 9, 1880, *M. E. Jones* 1642; Virgin River, 1844, *Fremont* 440.

ARIZONA: Fort Verde, October 11, 1887, *E. A. Mearns* 188; Holbrook, August 10, 1897, *Myrtle Zuck*; Total Wreck Mine, 1903, *Thorner* 60; Rincon Mountains, October 7, 1900, *D. Griffiths* 1781.

NEVADA: Thousand Spring Valley, September 1868, *S. Watson* 990 (in part); Muddy Valley, Lincoln County, May 6, 1906, *Kennedy & Goodding*.

CALIFORNIA: Mohave Desert, April 1905, *Mrs. C. DeKalb*; Radsburg, April 14, *A. A. Heller* 7705; Red Hill, west of Bishop, May 14, *A. A. Heller* 8253.

SONORA: Genaga di San Bernardino, 1855, *Schott*.

***Dondia calceoliformis* (Hook.) Rydb. comb. nov.**

Chenopodium calceoliformis Hook. Fl. Bor.-Am. 2: 126. 1838.

This, I think, deserves specific rank. It is characterized from *D. depressa* (Pursh) Britton and *D. erecta* (S. Wats.) A. Nels. by its broad and short, ovate or ovate-lanceolate bracts over 2 mm. wide.

AMARANTHACEAE

***Amaranthus pubescens* (Uline & Bray) Rydb. comb. nov.**

Amaranthus graecizans pubescens Uline & Bray, Bot. Gaz. 19: 317. 1894.

This probably deserves specific rank. It has been collected in Colorado.

Amaranthus carneus Greene and *A. californicus* S. Wats. should be added to the region. The former has been collected in Montana, and both in Idaho.

PORTULACACEAE

Limnia utahensis sp. nov.

Annual; stem 2-15 cm. long; basal leaves petioled; blades spatulate to linear, 1-3 cm. long, 2-6 mm. wide; stem leaves connate, forming an oblique, 2-lobed disk, 1-2 cm. broad; inflorescence very short, corymbiform; fruiting sepals ovate, acute, 2-3 mm. long, about equalling the pedicels; seeds about 1.5 mm. in diameter, minutely muricate.

This species resembles in habit *L. depressa* (A. Gray) Rydb. and *L. spathulata* (Dougl.) Heller but differs from the former in the long and narrow blades of the basal leaves and more connate stem leaves, from the latter in the large and broad stem leaves, and from both in the large seeds.

UTAH: St. George, 1877, *Palmer* 56 (type, in herb. Columbia University); 1874, *C. C. Parry* 23 and 24.

I have not seen the type of *Montia Viae* A. Nels.,* but from the description and specimens named by Professor Nelson I judge it is the same as *Limnia depressa* (Robinson) Rydb.† published a few months earlier.

Coulter and Nelson report *Calyptridium roseum* S. Wats. from western Wyoming, but I think this must be a mistake.

Professor A. O. Garrett and myself collected *Talinum brachypodium* S. Wats. in southeastern Utah. Miss A. Eastwood has reported it from the same region.

ALSINACEAE

Cerastium thermale sp. nov.

Cerastium arvense fuegianum Hollick & Britton, Bull. Torrey Club

14: 50. 1887. Not Hook. 1854.

Cerastium fuegianum A. Nels.; Coult. & Nels. New Man. Bot. Rocky Mts. 184. 1899.

Densely caespitose perennial; stems decumbent at the base, 5-10 cm. long, viscid-puberulent; leaves yellowish green, less than 1 cm. long, lanceolate, acute, or the lower oblong or spatulate and often obtuse, coriaceous, with a very thick midrib, finely viscid-puberulent; cymes 1-7-flowered, usually condensed and with short pedicels; sepals 4 mm. long, glandular-puberulent, ovate, scarious-

* Bot. Gaz. 42: 48. 1906.

† Bull. Torrey Club 33: 139. 1906.

margined; petals about 5 mm. long; capsule about 6 mm. long, slightly curved near the upper end.

This is *Cerastium arvense fuegianum* Hollick & Britton, but not that of Hooker. It differs from *C. strictum* L., its nearest relative, in the low, depressed stem, yellowish herbage, thicker and smaller leaves, the lower of which are often obtuse, and the smaller more condensed flowers. It grows on geyser formations in the Yellowstone National Park, at an altitude of about 2,000 m.

WYOMING: Lower Geyser Basin, Aug. 4, 1897, Rydberg & Bessey 4025 (type, in herb. N. Y. Bot. Garden); Aug. 11, 1872, J. M. Coulter.

***Alsine Palmeri* sp. nov.**

A caespitose perennial; stems several, spreading, 5 cm. high or less, glabrous; leaves ovate or ovate-lanceolate, 2-5 mm. long, fleshy, acute; cyme 3-7-flowered; bracts lanceolate, green; sepals lanceolate, 2.5-3 mm. long, acute; petals about equalling the sepals.

The type was named *Stellaria borealis* by Dr. Watson but is evidently not closely related to it. *A. Palmeri* has the thick leaves of *A. Edwardsii* (R. Br.) Rydb., but the midribs are not prominent, the flowers smaller, the sepals decidedly acute, and the petals only about equalling the sepals in length.

UTAH: Beaver Valley, 1877, E. Palmer 54 (type, in herb. Columbia University).

***Alsine alpestris* (Fries) Rydb. comb. nov.**

Stellaria alpestris Fries, Mant. 1: 10. 1832.

***Alsine strictiflora* Rydb. nom. nov.**

Stellaria stricta Richards, Frankl. Jour. ed. 2. App. 15. 1823.

Not *Alsine stricta* Wahlenb. 1812.

This is the *Stellaria longipes* of most western reports and of Coulter & Nelson's New Manual. It has a short pod and acute sepals, while the original *Stellaria longipes* Goldie has the pods twice as long as the obtuse sepals. If I am not mistaken the latter is the same as *Stellaria valida* Goodding.

***Alsine subvestita* (Greene) Rydb. comb. nov.**

Stellaris subvestita Greene, Ottawa Nat. 15: 42. 1901.

***Arenaria cephaloidea* sp. nov.**

Somewhat caespitose perennial; stem strict, 2-4 dm. high, glabrous; leaves glabrous, erect, filiform-subulate, 3-10 cm. long; flowers in dense headlike cymes; bracts lanceolate, often 1 cm. long, scarious except the thick midrib, scabrous-ciliolate; sepals similar or somewhat broader, 4-5 mm. long; petals oblong, about half longer than the sepals.

This is related to *A. congesta* Nutt. but differs in its narrower bracts, which are wholly scarious, except the midrib, and scabrous-ciliolate on the margins; also in its larger flowers, stricter stem, and less caespitose base.

WASHINGTON: Spokane, Sept. 10, 1902, *O. Kreager 617* (type, in herb. N. Y. Bot. Garden); Clark Springs, July 17, 1902, *Kreager 100*; Loon Lake, July 20, 1897, *J. B. Winston*; Spokane County, June 27, 1884, *Suksdorf*.

IDAHO: Lake Coeur d'Alene, June and July 1892, *G. B. Aiton*; Little Potlatch River, June 2, 1892, *Sandberg, MacDougal & Heller 478*.

***Arenaria lithophila* Rydb. comb. nov.**

Arenaria subcongesta lithophila Rydb. Mem. N. Y. Bot. Gard. 1: 148. 1900.

This, I think, deserves specific rank. Some of the specimens recorded as *A. subcongesta* (S. Wats.) Rydb. should also be referred to it.

***Alsinopsis dawsonensis* (Britt.) Rydb. comb. nov.**

Arenaria dawsonensis Britt. Bull. N. Y. Bot. Gard. 2: 169. 1901.

This species has been collected in the Black Hills of South Dakota.

***Alsinopsis pusilla* (S. Wats.) Rydb. comb. nov.**

Arenaria pusilla S. Wats. Proc. Am. Acad. 17: 367. 1882.

This species has been collected in Idaho.

***Arenaria laxiflora* nom. nov.**

Arenaria Fendleri diffusa Porter, Syn. Fl. Colo. 13. 1874. Not *A. diffusa* Ell. 1818.

Ammodenia oblongifolia (T. & G.) Rydb. comb. nov.

Arenaria peploides major Hook. Fl. Bor.-Am. 1: 102. 1831.

Honckenya oblongifolia T. & G. Fl. N. Am. 1: 176. 1838.

Arenaria sitchensis Dietr. Syn. Pl. 2: 1565. 1840.

B. T. Butler has collected in Montana what seems to be *Arenaria laricifolia* L. At least it is the same plant as the one collected by Turner on the Porcupine River, Alaska, on the strength of which *A. laricifolia* is included in the American flora.

Sagina occidentalis S. Wats. has been collected in Idaho by Leijberg.

CARYOPHYLLACEAE

WAHLBERGELLA Fries, Bot. Not. 1843: 143. 1843

The treatment of the Silenoid genera of this family has been very different in this country and in Europe. S. Watson and B. L. Robinson admitted only two genera, *Silene* and *Lychnis*, while Pax* admitted beside *Silene* the genera *Lychnis*, *Melandrium*, and *Viscaria*, and Williams† admitted *Lychnis*, *Coronaria*, *Viscaria*, *Eudianthe*, and *Melandrium*. The only distinction given by Watson and Robinson is the number of styles, in *Silene* 3, in *Lychnis* 5, but Robinson admits that in some species of *Silene* the styles are sometimes 4 or 5. The number of styles is therefore not a very reliable character. Continental authors usually differentiate *Silene* from *Melandrium* (by Americans included in *Lychnis*) by the partially septate capsule of the former. According to Robinson this character is unreliable in our American species. Perhaps the species included in *Silene* without septum should be removed to *Melandrium* or to *Eudianthe*. As these doubtful species are not found in the Rockies, I shall give no opinion on them here. It is evident that the genus *Lychnis* as treated in America is an unnatural and composite group. Williams' treatment is perhaps the most logical. Pax included our native American species of *Lychnis* in *Melandrium* but divided the genus in three subgenera. One of these subgenera corresponds to *Eudianthe* with only 3 styles. The other two subgenera correspond to the original species of *Melandrium* and the genus *Wahlbergella* of Fries,

* Engl. & Prantl, Nat. Pflanzenf. 3: 1b: 70, 73. 1889.

† Jour. Bot. 31: 170, 171. 1893.

respectively. The typical species of *Lychnis* have 5-valved capsules with entire valves. In the typical species of *Melandrium* the valves are 2-cleft at the apex. In *Wahlbergella* the valves are also more or less notched. In that respect the species belong rather to *Melandrium* than to *Lychnis*. But the typical species of *Melandrium* are dioecious plants with ample long-exserted petals and of a different habit from that of our native species. These all have hermaphrodite flowers with very small and inconspicuous or even no petals. In my opinion the genus *Wahlbergella* should be taken up for our native species usually included in *Lychnis*. *Lychnis Drummondii* (Hook.) S. Wats. is somewhat different in habit and fruit and was referred to *Elisanthe* by Ruprecht, but I think it can well be included in *Wahlbergella*. Of course *L. striata* Rydb. is closely related to it and should be referred to the same genus, whatever disposition of it is made. The species of *Wahlbergella* in America are as follows:

***Wahlbergella Drummondii* (Hook.) Rydb. comb. nov.**

Silene Drummondii Hook. Fl. Bor.-Am. 1: 89. 1830.

Elisanthe Drummondii Rupr. Fl. Cauc. 1: 200. 1869.

Lychnis Drummondii S. Wats. Bot. King Exp. 37. 1871.

***Wahlbergella striata* Rydb. comb. nov.**

Lychnis striata Rydb. Bull. Torrey Club. 31: 408. 1904.

WAHLBERGELLA TRIFLORA (Vahl) Fries, Summa Veg. Scand. 155.
1845

Lychnis triflora R. Br. Ross. Voy. App. CXLII (hyponym). 1819.

Melandrium triflorum Vahl, in Liebm. Fl. Dan. 14⁴⁰: 5. 1843.

***Wahlbergella Taylorae* (Robinson) Rydb. comb. nov.**

Lychnis Taylorae Robinson, Proc. Am. Acad. 28: 150. 1893.

WAHLBERGELLA AFFINIS (Vahl) Fries, Bot. Not. 1843: 143. 1843

Lychnis affinis Vahl, in Fries, Nov. Mant. 3: 36. 1842.

Melandrium affine Vahl, in Liebm. Fl. Dan. 14⁴⁰: 5. 1843.

***Wahlbergella montana* (S. Wats.) Rydb. comb. nov.**

Lychnis montana S. Wats. Proc. Am. Acad. 12: 247. 1877.

Wahlbergella Kingii (S. Wats.) Rydb. comb. nov.

Lychnis Kingii S. Wats. Proc. Am. Acad. 12: 247. 1877.

Wahlbergella attenuata (Farr) Rydb. comb. nov.

Lychnis attenuata Farr, Contr. Bot. Lab. Univ. Pa. 2: 419. 1904.

Wahlbergella Parryi (S. Wats.) Rydb. comb. nov.

Lychnis Parryi S. Wats. Proc. Am. Acad. 12: 248. 1877.

WAHLBERGELLA APETALA (L.) Fries, Summa Veg. Scand. 155. 1845

Lychnis apetalum L. Sp. Pl. 1: 437. 1753.

Melandryum apetalum Fenzl; in Ledeb. Fl. Ross. 1: 326. 1842.

Wahlbergella uniflora Fries, Bot. Not. 1843: 143. 1843.

RANUNCULACEAE

Ranunculus rivularis sp. nov.

Ranunculus repens S. Wats. Bot. King Exp. 9. 1871.

A perennial with a fascicle of fibrous roots; stem hirsute, producing long stolons sometimes over 1 m. long, rooting at the nodes and there producing plantlets; leaves ternate, 5-15 cm. wide, divisions petiolate, ovate, usually truncate or subcordate at the base, 3-cleft and coarsely toothed; petals rounded-obovate, about 4 mm. long, scarcely equalling the sepals; head of fruit globose; achenes glabrous, beaks about one third their length.

The type was determined as *R. repens* L. by Dr. Watson, but is not so closely related to that species as to *R. Macounii* Britton. It was probably on account of the creeping and rooting habit that it was referred to the former. The small petals should at a glance have revealed the error, for in *R. repens* the petals are large and rounded, much exceeding the sepals. *R. Macounii* is occasionally decumbent but not rooting, and the outline of the leaflets or divisions is different and the beak about one half as long as the body of the achenes. My own specimens from Kimball, Nebraska, had stems over 1 m. long. It grows on wet river banks.

NEVADA: Huntington Valley, August 1868, *S. Watson* 27 (type, in herb. Columbia University).

ARIZONA: Clark Valley, August 1883, *Rusby*.

NEBRASKA: Kimball, August 12, 1891, *Rydberg* 7.

TEXAS: 1851, *Wright* 839.

***Thalictrum columbianum* sp. nov.**

A plant resembling *T. venulosum* Trelease in habit; stem 3-5 dm. high; leaves 2-4 times ternate, petioled except the uppermost; leaflets rather crowded, thick, and veiny, 1-2 cm. long, cuneate to nearly orbicular, 3-lobed and deeply toothed; inflorescence narrow; achenes oblong- or ovate-lanceolate, somewhat flattened, 4-5 mm. long, 1.5-2 mm. wide; veins strong, but not corky, and with broad and shallow grooves between.

The western specimens referred to *T. venulosum* by Dr. W. Trelease belong to this species, which differs mainly in the structure of the achenes, these approaching those of *T. megacarpum* Torr.

WASHINGTON: Loomiston, August 1897, *Elmer* 599 (type, in herb. N. Y. Bot. Garden); Yakima County, 1892, *Henderson* 2376.

IDaho: Pend d'Oreille River, 1861, *Lyall*; Lake Waha, July 1896, *A. A. & E. Gertrude Heller* 3361; De Lamar, July 7, 1892, *Miss Mulford*.

OREGON: 1886, *Cusick* 1337.

***Delphinium Leonardi* sp. nov.**

A perennial with a tuberous root; stem 2-5 dm. high, viscid-pubescent, especially above; blades of the basal leaves 4-5 cm. wide, dissected into oblong, obtuse divisions, more or less viscid-pubescent; upper leaves with linear, acute divisions; lower pedicels 4-8 cm. long, ascending; sepals dark blue, oblong, obtuse or the upper acute; spur about 2 cm. long, slightly s-curved; upper petals whitish, veined with blue, emarginate; lower petals blue, with short lobes; follicles over 2 cm. long, curved, viscid-pubescent or in age glabrate; seeds dark brown, wing-margined.

It grows on river banks and beaches at an altitude of 1,800-2,400 m. It is related to *D. bicolor* Nutt. but differs in its longer spur, which is half longer than the obtuse instead of acute lateral sepals.

UTAH: Garfield, May 30, 1884, *Leonard* 205 (type, in herb. N. Y. Bot. Garden); City Creek Canyon, April 21 and May 17, 1883, *Leonard* 32 and 24.

***Delphinium coelestinum* sp. nov.**

A perennial with a short rootstock and strong woody roots; stem 3-5 dm. high, glabrous or slightly pubescent above, leafy; leaves long-petioled; blades about 3 cm. broad, sparingly pubescent,

divided to the base into 3-5 narrowly cuneate divisions, these again cleft into linear-oblong, obtuse, mucronate lobes; sepals light blue, slightly pubescent outside, oblong, obtusish, about 1 cm. long; spur about 1 cm. long, usually somewhat curved; upper petals 8 mm. long, yellowish white, slightly lobed; lower petals light blue, with obtusish, wavy lobes; follicles 8-10 mm. long, slightly puberulent, nearly straight.

This species is related to *D. scaposum* but differs in its more leafy stem and in the more deeply dissected basal leaves with narrower segments. It grows in arid places.

UTAH: Southern Utah, 1877, *Palmer 11* (type, in herb. Columbia University).

ARIZONA: 1876, *Palmer 3*.

***Delphinium xylorrhizum* sp. nov.**

A perennial with a stout woody root, related to *D. scaposum* but not at all scapiform; stem 2-3 dm. high, glabrous; leaves petioled, glabrous, fleshy; blades of the basal ones divided into 3-5 broadly cuneate divisions, these cleft and lobed with ovate or rounded lobes; stem leaves with linear-oblong lobes; sepals dark blue, oval, obtuse, pubescent outside; spur stout, about 15 mm. long; upper petals yellowish, about 7 mm. long, slightly cleft, with obtuse lobes; lower petals blue, with sinuate, obtuse lobes; follicles canescent-strigose.

This species differs from *D. scaposum* Greene in its leafy stem and its strigose follicles. It grows on clayey hillsides.

MONTANA: Lima, July 1, 1895, *Shear 3429* (type, in herb. N. Y. Bot. Garden).

***Delphinium Helleri* sp. nov.**

A perennial with a short rootstock and fleshy roots; stem about 3 dm. high, viscid-pubescent throughout, few-leaved; leaf blades 3-5 cm. broad; the lower dissected into linear, obtuse divisions, more or less viscid-pubescent; the upper with narrowly linear, acute divisions; flowers few; the lower pedicels 4-6 cm. long, ascending; bractlets subulate, inserted some distance below the calyx; sepals dark blue, more or less pubescent, oval, about 15 mm. long; spur 2-2.5 cm. long, straight and attenuate; upper petals blue, tinged with yellow only on the lower edge, entire or slightly cleft, lower petals blue, with acute, crenate lobes; follicles viscid-pubescent, nearly straight, 2 cm. long.

This is related to *D. bicolor*, but the upper petals are dark blue and the spur is much longer.

IDAHO: Lewiston, April 1896, *A. A. & E. Gertrude Heller 2951* (type, in herb. Columbia University); region of Coeur d'Alene Mountains, June 24, 1895, *Leiberg 1031*.

***Delphinium viscidum* sp. nov.**

Perennial with a woody root; stem about 3 dm. high, grayish strigose below, densely glandular-viscid above; leaf blades 5–7 cm. broad, densely grayish strigose, dissected into narrowly linear lobes; inflorescence branched; sepals dark blue, 12–15 mm. long, oblong, acute; spur 10–12 mm. long, somewhat s-curved; upper petals yellowish, tinged with blue, obtuse, entire; lower petals dark blue, with obtuse, sinuate lobes; follicles densely strigose.

This species is related to *D. multiflorum* and *D. reticulatum*, but the leaves are finely dissected as in *D. Geyeri* and *D. scopulorum*.

WYOMING: Near Tie Siding, July 6, 1896, *Osterhout* (type, in herb. N. Y. Bot. Garden); Evanston, August 1878, *Harry Edwards*.

BRASSICACEAE

***Lepidium hirsutum* nom. nov.**

Lepidium intermedium v. *pubescens* Greene, Bot. Gaz. **6**: 157. 1880. Not *L. pubescens* Desv. 1814.

Lepidium medium pubescens Robinson, Syn. Fl. **1**¹: 127. 1895.

Lepidium virginicum subsp. *texanum* v. *pubescens* Thell. Mitt. Univ. Zürich **28**: 230. 1906.

***Physaria lanata* (A. Nels.) Rydb. comb. nov.**

Physaria didymocarpa lanata A. Nels. Bull. Torrey Club **31**: 241. 1904.

This, I think, deserves specific rank, but *P. grandiflora* Blankinship is nothing but the typical *P. didymocarpa*.

***Radicula trachycarpa* (A. Gray) Rydb. comb. nov.**

Nasturtium trachycarpum A. Gray, Bull. U. S. Geol. & Geog. Surv. **2**: 233. 1876.

CHEIRINIA Link, Enum. Hort. Berol. 2: 170. 1822

The type of the genus *Erysimum* (Tourn.) L. is *E. officinale* L., usually known under the name *Sisymbrium officinale* Scop. If the genus which has usually passed under the name *Erysimum* is regarded as distinct from *Cheiranthus*, it must be known under another name. The oldest available name is *Cheirinia*, with *Erysimum cheiranthoides* as the type. As I regard the Rocky mountain species well distinct generically from the wallflower of Europe, I adopt *Cheirinia* as the name for the genus.

CHEIRINIA CHEIRANTHOIDES (L.) Link, Enum. Hort. Berol.
2: 170. 1822

Erysimum cheiranthoides L. Sp. Pl. 661. 1753.

Cheiranthus cheiranthoides Heller, Cat. N. Am. Pl. 4. 1898.

Cheirinia syrticola (Sheld.) Rydb. comb. nov.

Erysimum syrticolum Sheld. Bull. Torrey Club 20: 285. 1893.

Cheiranthus syrticola Greene, Pittonia 3: 136. 1896.

Cheirinia inconspicua (S. Wats.) Rydb. comb. nov.

Erysimum parviflorum Nutt. in T. & G. Fl. N. Am. 1: 95. 1838.

Not *E. parviflorum* Pers. 1807.

Erysimum asperum inconspicuum S. Wats. Bot. King Exp. 24.
1871.

Erysimum inconspicuum MacMillan, Metasp. Minn. Valley 268.
1892.

Cheiranthus inconspicuus Greene, Pittonia 3: 134. 1896.

Cheirinia arida (A. Nels.) Rydb. comb. nov.

Cheiranthus aridus A. Nels. Bull. Torrey Club 26: 351. 1899.

Cheirinia aspera (Nutt.) Rydb. comb. nov.

Cheiranthus asper Nutt. Gen. N. Am. Pl. 2: 69. 1818.

Erysimum asperum DC. Syst. 2: 505. 1821.

Cheirinia elata (Nutt.) Rydb. comb. nov.

Erysimum elatum Nutt. in T. & G. Fl. N. Am. 1: 95. 1838.

Cheiranthus elatus Greene, Pittonia 3: 135. 1896.

Cheirinia asperrima (Greene) Rydb. comb. nov.

Cheiranthus asperrimus Greene, Pittonia 3: 133. 1896.

Cheirinia oblanceolata Rydb. comb. nov.

Erysimum oblanceolatum Rydb. Bull. Torrey Club 31: 557. 1904.

Cheirinia Bakeri (Greene) Rydb. comb. nov.

Cheiranthus aridus Greene, Pittonia 4: 198. 1900. Not *C. aridus*
A. Nels. 1899.

Cheiranthus Bakeri Greene, Pittonia 4: 235. 1901.

Erysimum Bakeri Rydb. Bull. Torrey Club 33: 141. 1906.

Cheirinia argillosa (Greene) Rydb. comb. nov.

Cheiranthus argillosus Greene, Pittonia 3: 136. 1896.

Erysimum argillosum Rydb. Bull. Torrey Club 33: 141. 1906.

Cheirinia nivalis (Greene) Rydb. comb. nov.

Cheiranthus nivalis Greene, Pittonia 3: 137. 1896.

Erysimum nivale Rydb. Bull. Torrey Club 31: 558. 1904.

Cheirinia radicata Rydb. comb. nov.

Erysimum radicatum Rydb. Bull. Torrey Club 31: 558. 1904.

Cheirinia Wheeleri (Rothr.) Rydb. comb. nov.

Erysimum Wheeleri Rothr. Rep. U. S. Geog. & Geol. Surv. 6: 64.
1878.

Cheiranthus Wheeleri Greene, Pittonia 3: 135. 1896.

Erysimum asperum alpestre Cockerell, Bull. Torrey Club 18: 168.
1891.

Erysimum alpestre Rydb. Bull. Torrey Club 28: 277. 1901.

Cheirinia amoena (Greene) Rydb. comb. nov.

Cheiranthus nivalis amoenus Greene, Pittonia 3: 137. 1896.

Erysimum amoenum Rydb. Bull. Torrey Club 33: 143. 1906.

Cheirinia Pallasii (Pursh) Rydb. comb. nov.

Cheiranthus Pallasii Pursh, Fl. Am. Sept. 436. 1814.

Cheiranthus pygmaeus Adams, Mém. Soc. Nat. Mosc. 5: 144.
1817.

Hesperis pygmaeus Hook. Fl. Bor.-Am. 1: 60. 1830.

Erysimum pygmaeum J. Gay, Erys. Nov. 4. 1842.

***Cheirinia brachycarpa* sp. nov.**

Biennial; stem 3–6 dm. high, from a taproot, grayish canescent, somewhat striate; leaves all linear-spatulate or oblanceolate, 5–10 cm. long, sparingly canescent; the lower petioled and often minutely denticulate, the upper ones mostly entire; sepals oblong, about 1 cm. long, yellowish green; petals nearly 2 cm. long; claw long and slender; blades rounded-obovate, about 7 mm. wide, bright yellow; fruiting pedicels about 8 mm. long, strongly ascending; pods erect, 4–6 cm. long, 2.5 mm. thick; beak about 1 mm. long.

This species resembles *C. oblanceolata*, but the pod is much thicker and shorter and the flowers larger. It differs from *C. aspera* in its ascending, not divergent, and shorter pod. It grows on dry hillsides at an altitude of 2,500–3,000 m.

UTAH: Abajo Mountains, August 17–20, 1911, *Rydberg & Garrett 9713* (type, in herb. N. Y. Bot. Garden, flowers and young fruit); *9765* (well-developed fruit); Cottonwood Canyon, June 27 and July 1, 1905, *Rydberg & Carlton 6333* and *6570*.

***Sophia leptostylis* sp. nov.**

Annual; stem 3–6 dm. high, rather simple below, sparingly stellate-pubescent or glabrous; leaves 3–10 cm. long, obovate in outline, twice pinnatifid, with oblong divisions, sparingly stellate-pubescent; the uppermost reduced and with narrower lobes; flowers numerous; sepals elliptic, yellow, 1–1.5 mm. long; petals spatulate, a little surpassing the sepals; pedicels in fruit 5–8 mm. long, spreading-ascending; pods about 5 mm. long, tapering to each end, nearly erect, somewhat curved; styles 0.5–0.7 mm. long; seeds more or less in two rows.

This resembles somewhat *S. procera*, especially in the form of the pods, but the inflorescence is more open and the pedicels more spreading. It grows at an altitude of 2,000–3,000 m.

UTAH: Big Cottonwood Canyon, July 4, 1905, *Rydberg & Carlton 6629* (type, in herb. N. Y. Bot. Garden); also June 29, *6498*, and July 8, *6806*; Big Cottonwood Canyon, June 1905, *Garrett 1361*; near Milford, June 22, 1905, *Rydberg & Carlton 6283*; mountains north of Bullion Creek, near Marysville, July 23, *Rydberg &*

Carlton 6283; Fish Lake, August 2, 1909, *Garrett* 2578; Elk Mountains, August 8, 1911, *Rydberg & Garrett* 9552; Head of Dry Wash, August 11, 1911, 9628; Mount Ellen, July 25, 1894, *M. E. Jones* 5684g; Logan Canyon, June 28, 1910, *C. P. Smith* 2226.

***Arabis MacDougalii* sp. nov.**

Perennial; stem 4–6 dm. high, simple below, densely stellate-pubescent; basal leaves narrowly oblanceolate, 2–4 cm. long, entire or denticulate, densely stellate-pubescent; stem leaves linear or linear-lanceolate, sagittate at the base; sepals oblong, stellate-pubescent; petals white, oblanceolate, 5–6 mm. long; pedicels in fruit reflexed, 5–10 mm. long; pods finely stellate-pubescent, reflexed, 4–5 cm. long, 1.5 mm. wide; seeds in one row.

This species is related to *A. subpinnatifida* but differs in its smaller white petals and its entire leaves.

MONTANA: Old Sentinel, near Missoula, June 12, 1901, *MacDougal* 191 (type, in herb. N. Y. Bot. Garden).

NEVADA: King Canyon, Ormsby County, June 4, 1902, *C. F. Baker* 986 (referred here doubtfully).

***Arabis brevisiliqua* sp. nov.**

Biennial; stems 3–4 dm. high, sparingly stellate-pubescent below, otherwise glabrous; basal leaves narrowly oblanceolate, 1–2 cm. long, finely stellate-pubescent; stem leaves linear, sagittate at the base, glabrous; sepals scarious-margined, 3 mm. long, glabrous or nearly so; petals purplish, about 6 mm. long; pedicels in fruit 3–5 mm. long, recurved pods 2–3 cm. long, 2 mm. wide, glabrous; seeds in two rows.

This species resembles *A. lignifera* A. Nels., but the pod is much shorter, less than 3 cm. long, with the seeds in two rows, and the sepals are glabrous instead of stellate-pubescent.

BRITISH COLUMBIA: Skagit Valley, July 6, 1905, *J. M. Macoun* 70825 (type, in herb. N. Y. Bot. Garden); near international boundary, between Kettle and Columbia rivers, July 16, 1902, *J. M. Macoun* 63496.

ALBERTA: Trail to Lake O'Hara, August 8, 1904, *John Macoun* 64517 in part.

***Parrya platycarpa* sp. nov.**

Parrya macrocarpa S. Wats. Bot. King Exp. 14. 1871. Not *P. macrocarpa* R. Br. 1821.

Perennial with a stout caudex; leaves basal, runcinate, more or less glandular-hirsutulous, thick, 6–8 cm. long, oblanceolate in outline; scape 1–1.5 dm. long, glandular-hirsutulous; sepals oblong, 8 mm. long, saccate at the base; petals 15–18 mm. long, purplish; claws long, exceeding the sepals; blades obovate; fruiting pedicels 8–15 mm. long, ascending; pod erect, glandular-hispidulous, 3–4 cm. long, 6–7 mm. wide, acute at both ends, slightly constricted between the seeds, these broadly winged, 3–4 mm. wide.

This is characterized by its deeply lobed leaves, the hispidulous pubescence, the broad hispidulous pod, and the longer narrow petals with slender claws.

UTAH: Uintah Mountains, August 1869, *S. Watson* 54 (type, in herb. Columbia University); also August 1889 and Aug. 11, 1890, *M. E. Jones*.

***Smelowskia lobata* sp. nov.**

A densely caespitose perennial; earlier basal leaves cuneate or oblanceolate, merely lobed, with oblong divisions or even some of the earliest entire; the rest of the leaves pinnatifid, densely white stellate-floccose; stem 1 dm. high or less; sepals densely villous, 3 mm. long, ovate, acute; petals white, clawed; blades rounded-obovate; pod glabrous, about 5–6 mm. long, oblanceolate, tapering at the base; style very short.

This species has the pubescence of *S. ovata*, but the pod is tapering at the base. It has whiter and longer pubescence than *S. americana*, and the pod is much shorter. It differs from both in the shape of the earlier leaves.

ALBERTA: Northern Rocky Mountains, *Bourgeau*, Palliser Expedition (type, in herb. Columbia University).

MONTANA: Midvale, June 28 and July 9, 1903, *Umbach* 206 and 325.

MACKENZIE: *Richardson* (Franklin's Journey).

***Draba pectinata* (S. Wats.) Rydb. comb. nov.**

Draba glacialis pectinata S. Wats. Proc. Am. Acad. **23**: 260. 1888.

This has been confused with *D. andina* Nutt. and *D. densiflora* Nutt., but it is easily distinguished by the leaves. They are scarcely stellate-pubescent, merely strongly ciliate on the margins and with an incurved tip. In the other two species the leaves

are densely stellate-pubescent and their tips not incurved but spreading. The pods of *D. andina* and *D. pectinata* are nearly the same, but that of *D. densiflora* is larger and more elongated.

Nelson, in the New Manual of the Central Rocky Mountain Region, cited *Draba uber* A. Nels., *D. aureiformis* Rydb., and *D. decumbens* Rydb. as synonyms of *D. luteola* Greene. The species he described under that name is evidently *D. aurea* Vahl, of which *D. uber* apparently is a synonym. *D. luteola* and *D. aureiformis*, on the contrary, are closely related to *D. surculifera* A. Nels. but have light yellow flowers. A "conservative" botanist would unite the three. *D. decumbens* Rydb. is not closely related to either. Very likely Professor Nelson had not seen a specimen of the last named.

Fortunately, *Draba lapilutea* A. Nels. and *D. yellowstonensis* A. Nels. become synonyms of *D. praealta* Greene. *Draba deflexa* Greene has erroneously become *D. reflexa* in the New Manual.

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